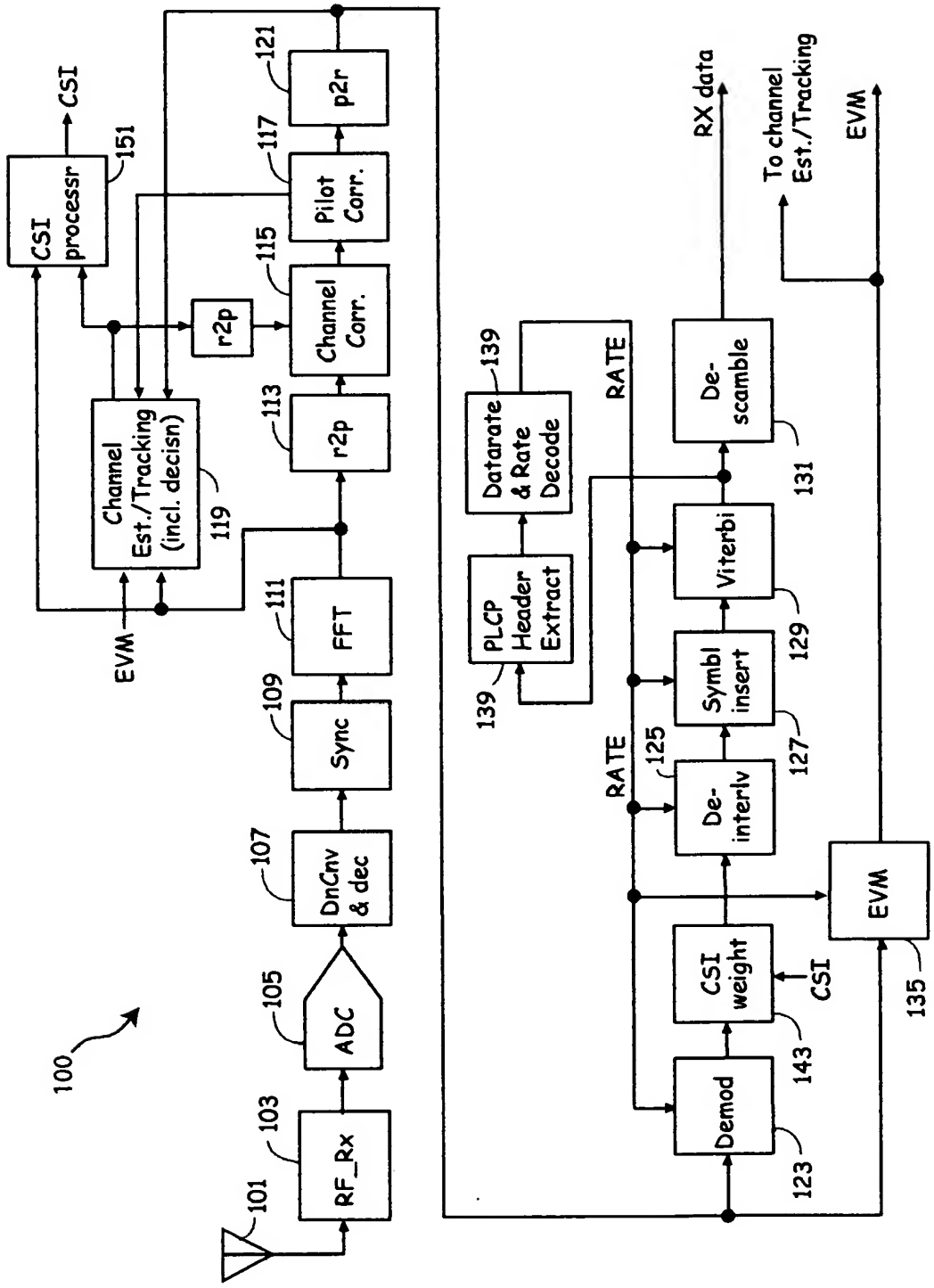
100
101
103
RF_Rx
105
ADC
107
DnCnv & dec
109
Sync
111
FFT
113
r2p
115
Channel Corr.
117
Pilot Corr.
119
Channel Est./Tracking (incl. decisn)
121
p2r
151
CSI processr
CSI
EVM
r2p
139
PLCP Header Extract
Datarate & Rate Decode
RATE
RATE
125
De-interlv
127
Symbl insert
129
Viterbi
131
De-scamble
RX data
To channel Est./Tracking
EVM
123
Demod
143
CSI weight
CSI
135
EVM

FIG. 1

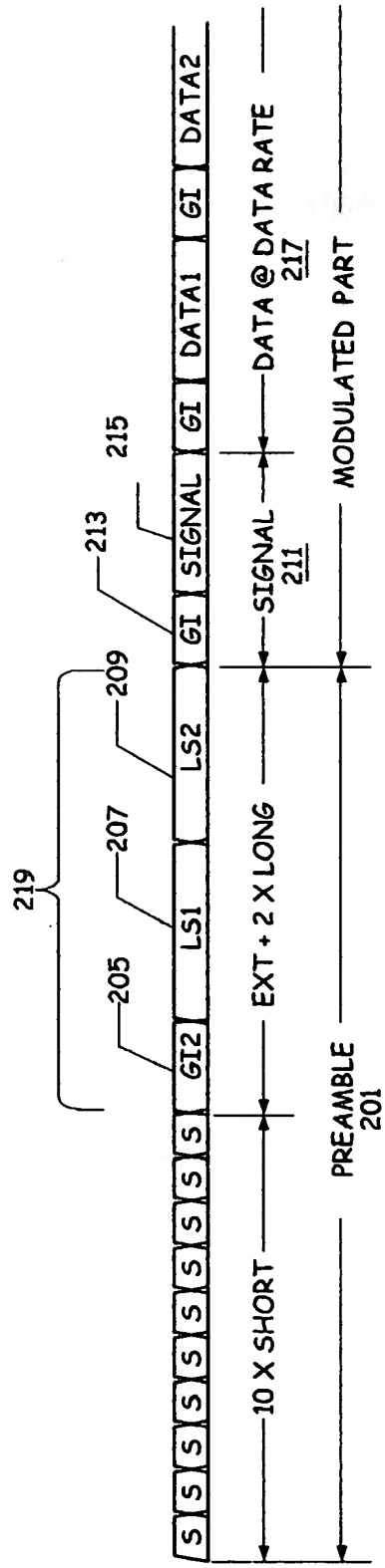

FIG. 2 (PRIOR ART)

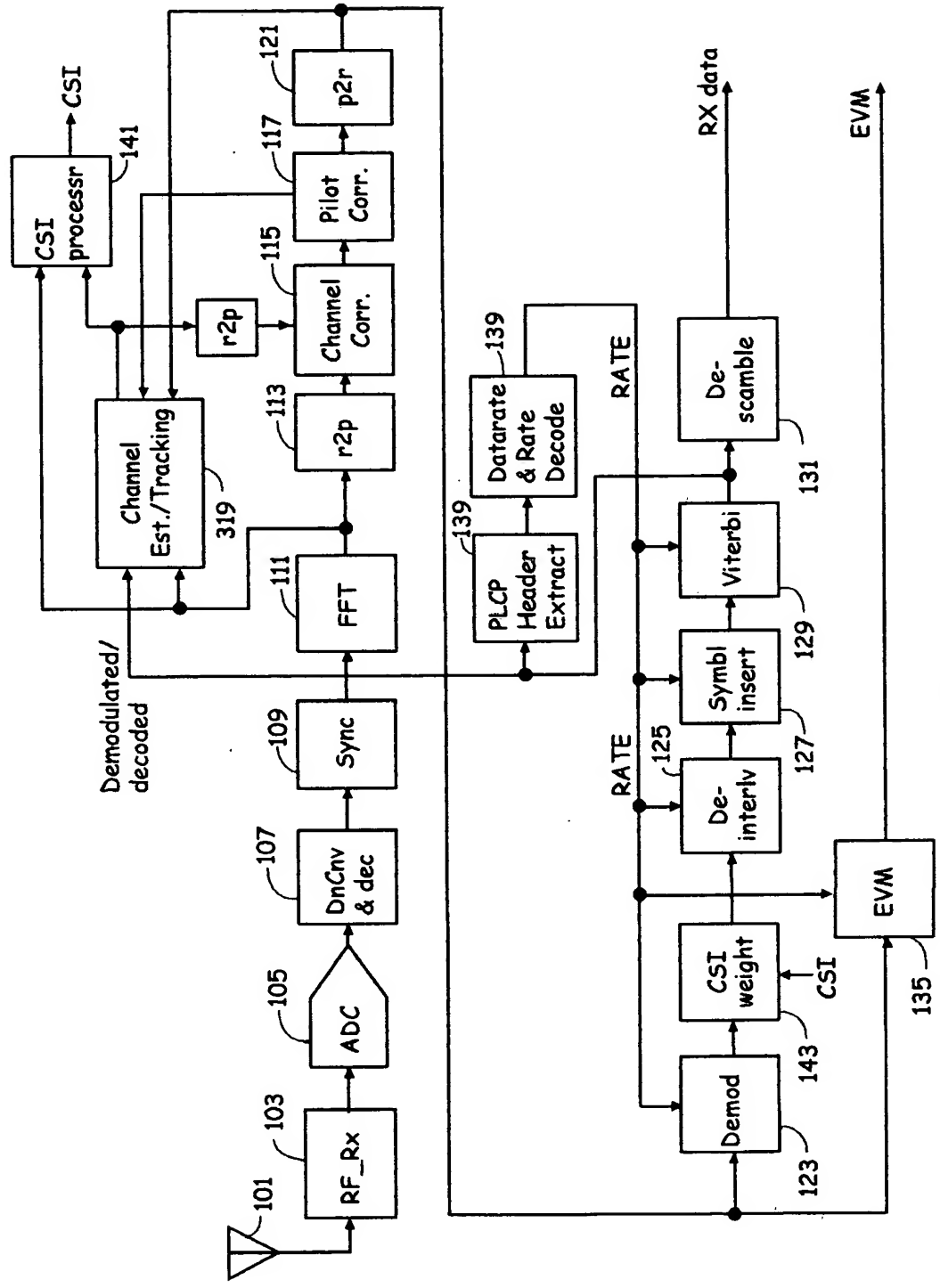
CSI
CSI processr
141
121
p2r
117
Pilot Corr.
115
Channel Corr.
r2p
113
r2p
Channel Est./Tracking
319
111
FFT
109
Sync
107
DnCnv & dec
105
ADC
103
RF_Rx
101
Demodulated/ decoded
139
PLCP Header Extract
139
Datarate & Rate Decode
RATE
RX data
EVM
De-scamble
131
Viterbi
129
Symbl insert
127
125
De-interlv
RATE
CSI weight
CSI
143
Demod
123
EVM
135

FIG. 3

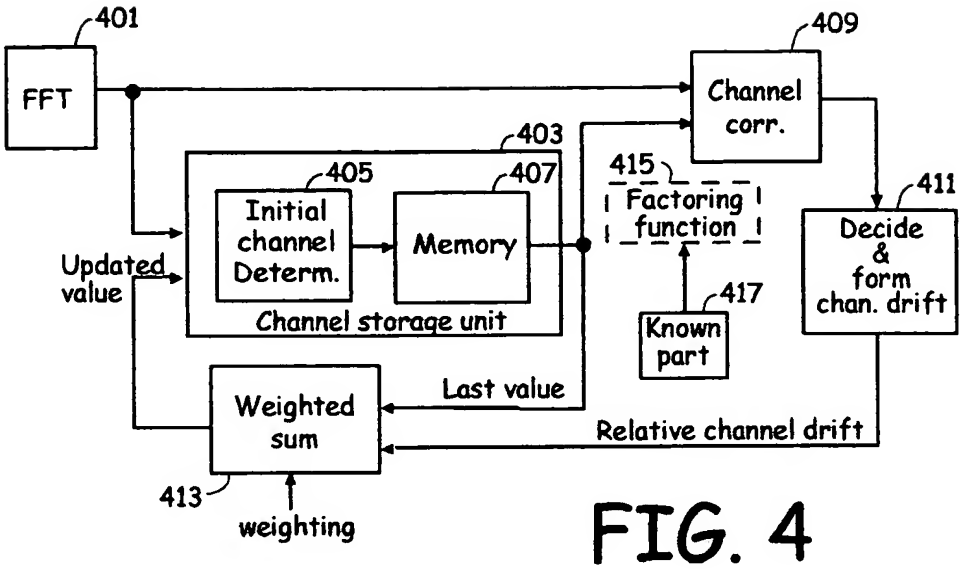
401
FFT
409
Channel corr.
403
405
Initial channel Determ.
407
Memory
415
Factoring function
411
Decide & form chan. drift
Updated value
Channel storage unit
417
Known part
Last value
Weighted sum
Relative channel drift
413
weighting

FIG. 4

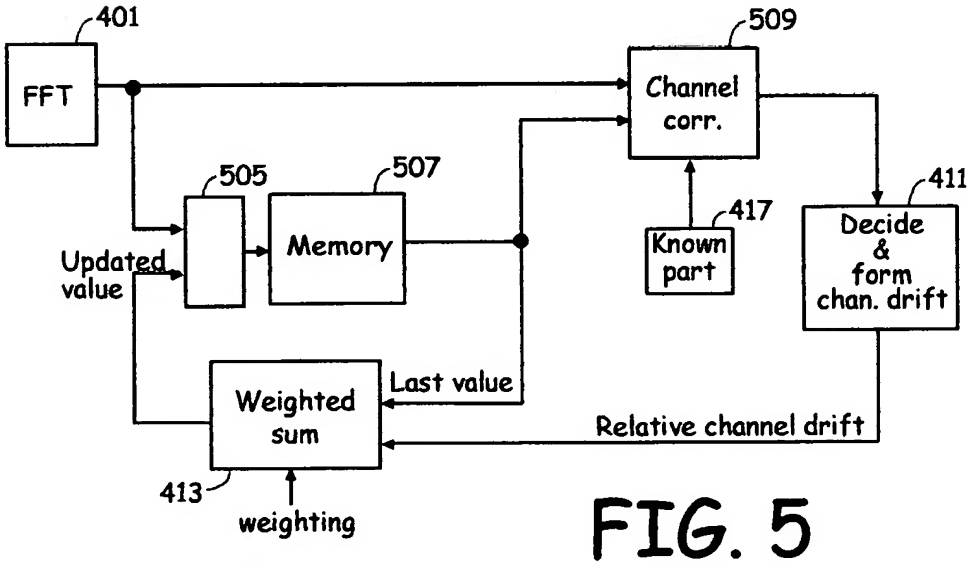
401
FFT
509
Channel corr.
505
507
Memory
411
Decide & form chan. drift
417
Known part
Updated value
Last value
Weighted sum
Relative channel drift
413
weighting

FIG. 5

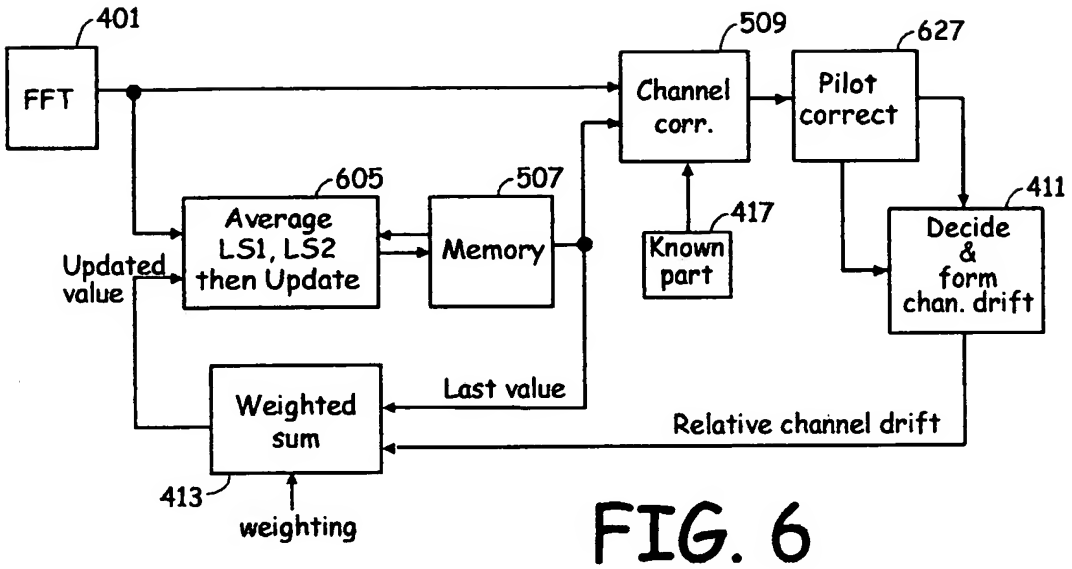
401
FFT
509
Channel corr.
627
Pilot correct
605
Average LS1, LS2 then Update
507
Memory
417
Known part
411
Decide & form chan. drift
Updated value
Last value
Weighted sum
Relative channel drift
413
weighting

FIG. 6

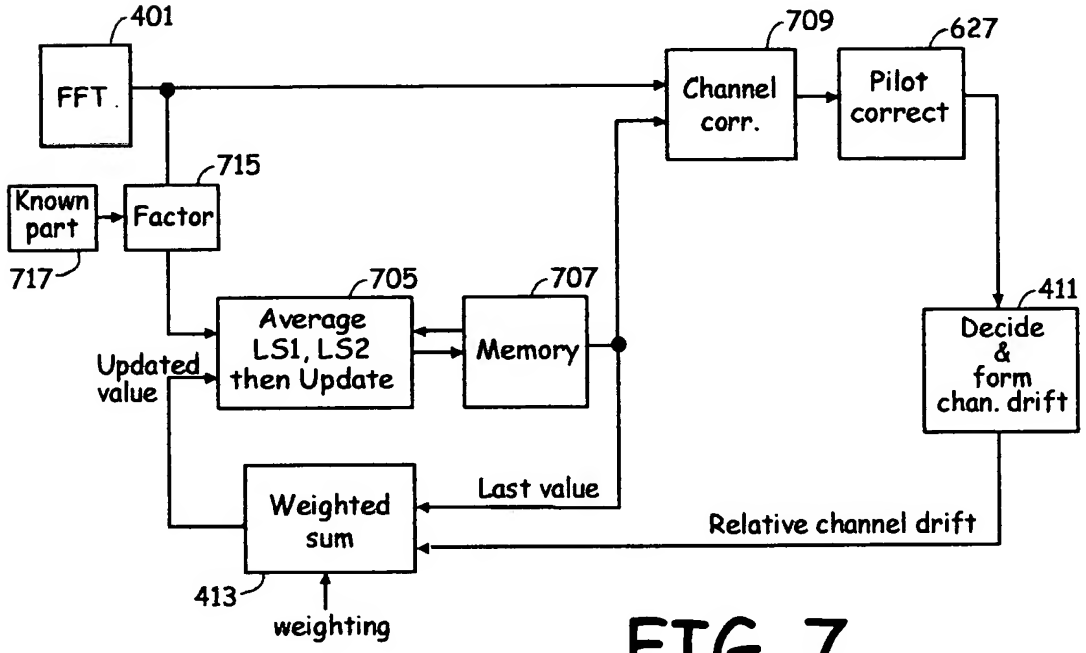
401
FFT
709
Channel corr.
627
Pilot correct
715
Known part
Factor
717
705
Average LS1, LS2 then Update
707
Memory
411
Decide & form chan. drift
Updated value
Last value
Weighted sum
Relative channel drift
413
weighting

FIG. 7

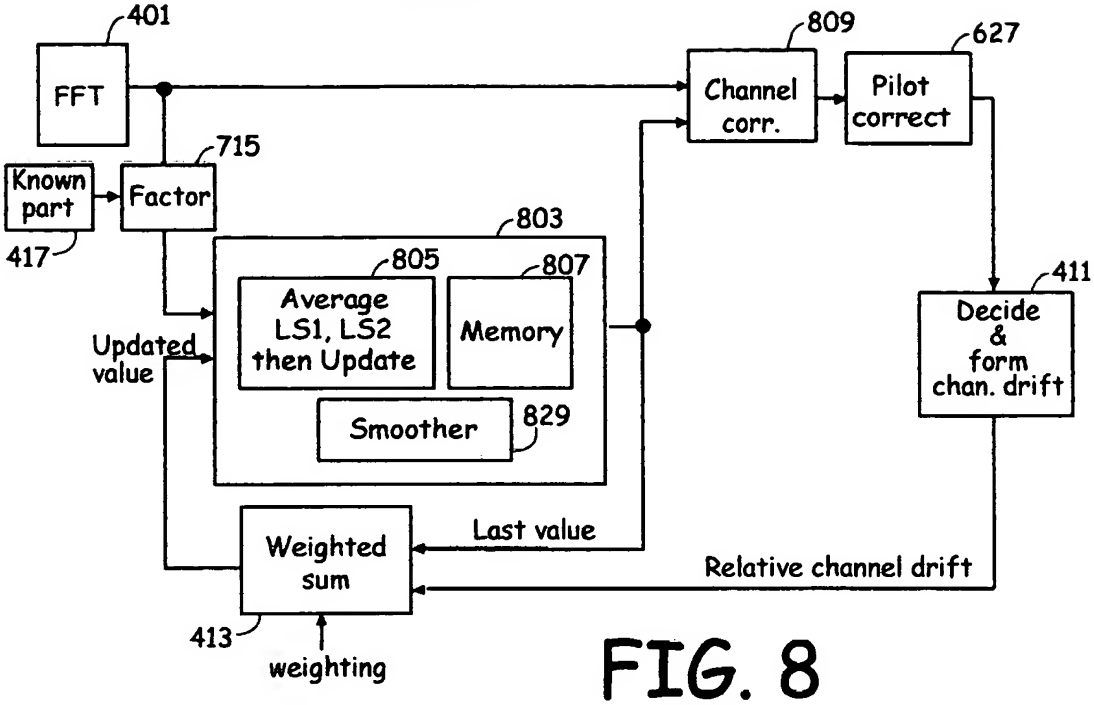
401
FFT
809
Channel corr.
627
Pilot correct
715
Known part
Factor
417
803
805
Average LS1, LS2 then Update
807
Memory
Updated value
Smoother
829
411
Decide & form chan. drift
Weighted sum
Last value
Relative channel drift
413
weighting

FIG. 8

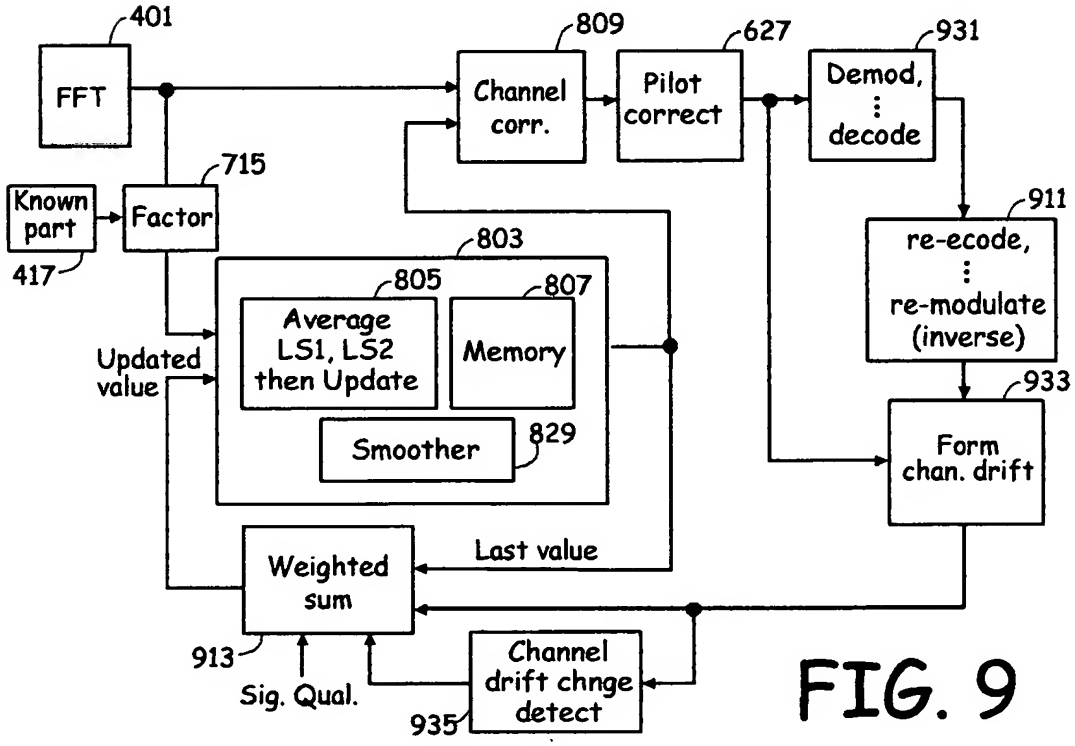
401
FFT
809
Channel corr.
627
Pilot correct
931
Demod, decode
715
Known part
Factor
417
911
re-ecode, re-modulate (inverse)
803
805
Average LS1, LS2 then Update
807
Memory
Updated value
Smoother
829
933
Form chan. drift
Weighted sum
Last value
913
Sig. Qual.
Channel drift chnge detect
935

FIG. 9

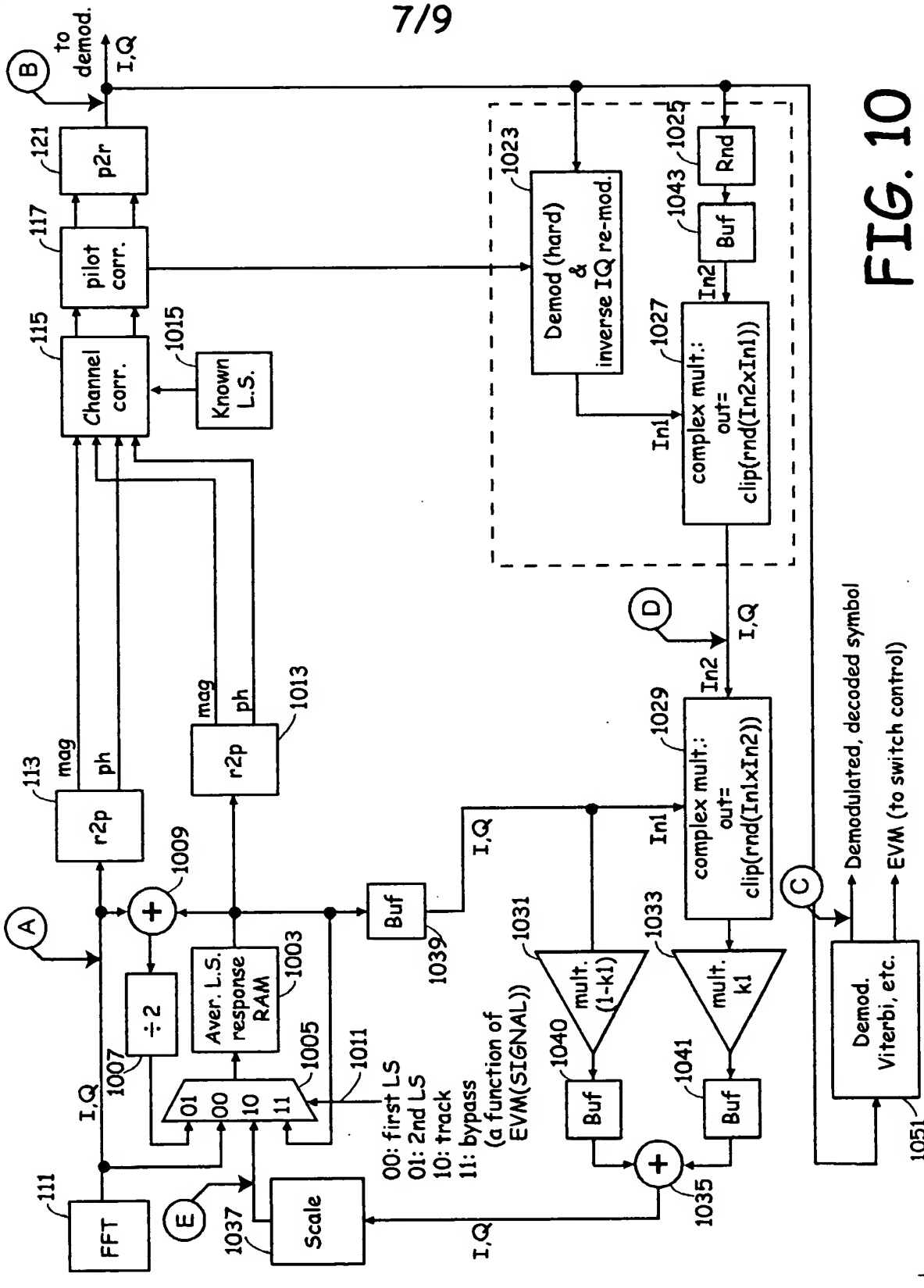
B
to demod.
I,Q
121
p2r
117
pilot corr.
115
Channel corr.
1015
Known L.S.
1023
Demod (hard) & inverse IQ re-mod.
1025
Rnd
1043
Buf
In2
1027
In1
complex mult.: out= clip(rnd(In2xIn1))
D
I,Q
In2
1029
In1
complex mult.: out= clip(rnd(In1xIn2))
C
Demodulated, decoded symbol
EVM (to switch control)
Demod. Viterbi, etc.
1051
113
mag
ph
r2p
1009
A
mag
ph
r2p
1013
Buf
1039
I,Q
1031
mult. (1-k1)
1033
mult. k1
1040
Buf
1041
Buf
1035
1007
÷ 2
I,Q
Aver. L.S. response RAM
1003
1005
01
00
10
11
1011
00: first LS
01: 2nd LS
10: track
11: bypass
(a function of EVM(SIGNAL))
111
FFT
E
1037
Scale
I,Q

FIG. 10

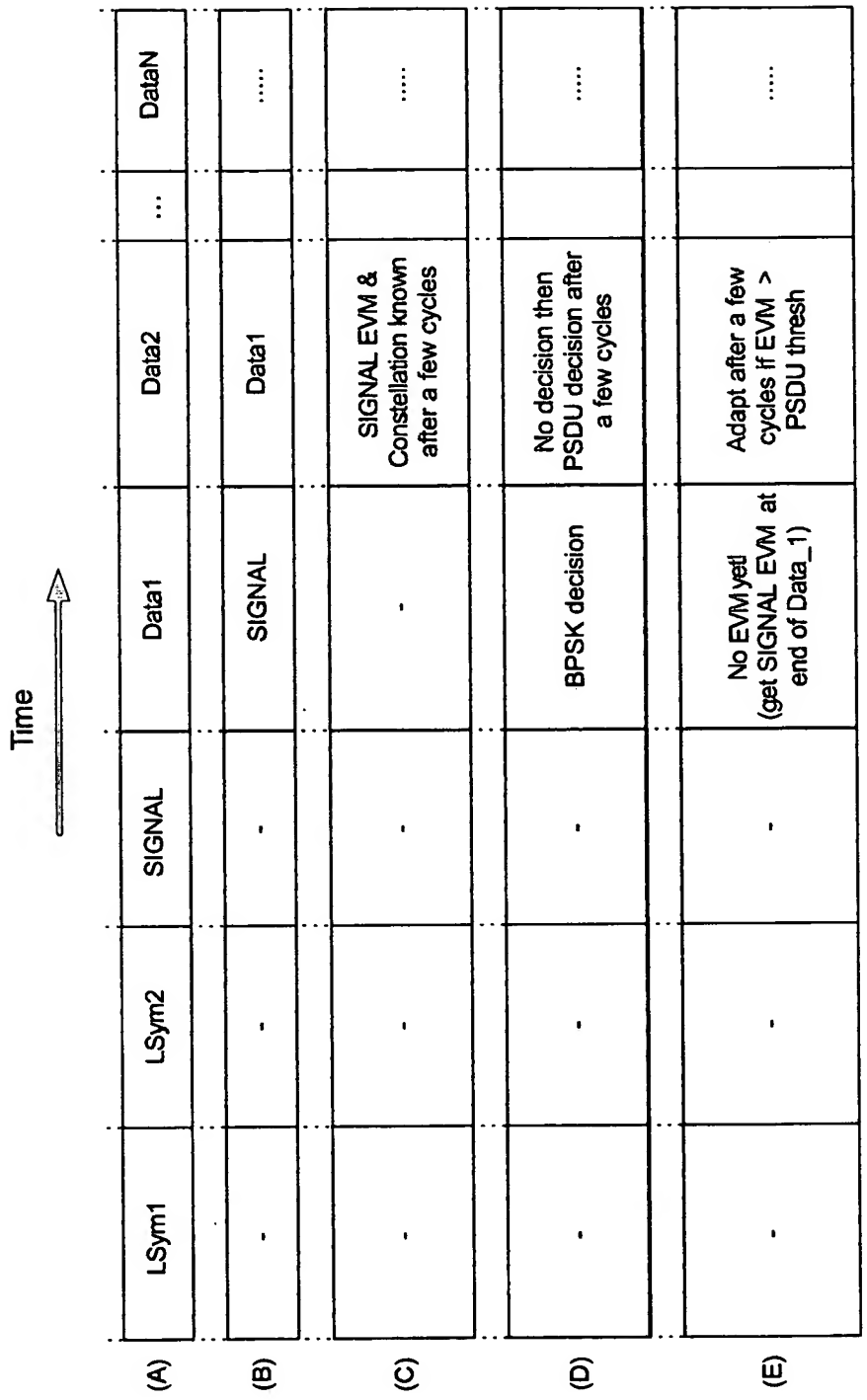
Time
LSym1
LSym2
SIGNAL
Data1
Data2
...
DataN
(A)
(B)
(C)
(D)
(E)
-
-
-
-
-
SIGNAL
Data1
.....
-
SIGNAL EVM & Constellation known after a few cycles
.....
BPSK decision
No decision then PSDU decision after a few cycles
.....
No EVM yet! (get SIGNAL EVM at end of Data_1)
Adapt after a few cycles if EVM > PSDU thresh
.....

FIG. 11

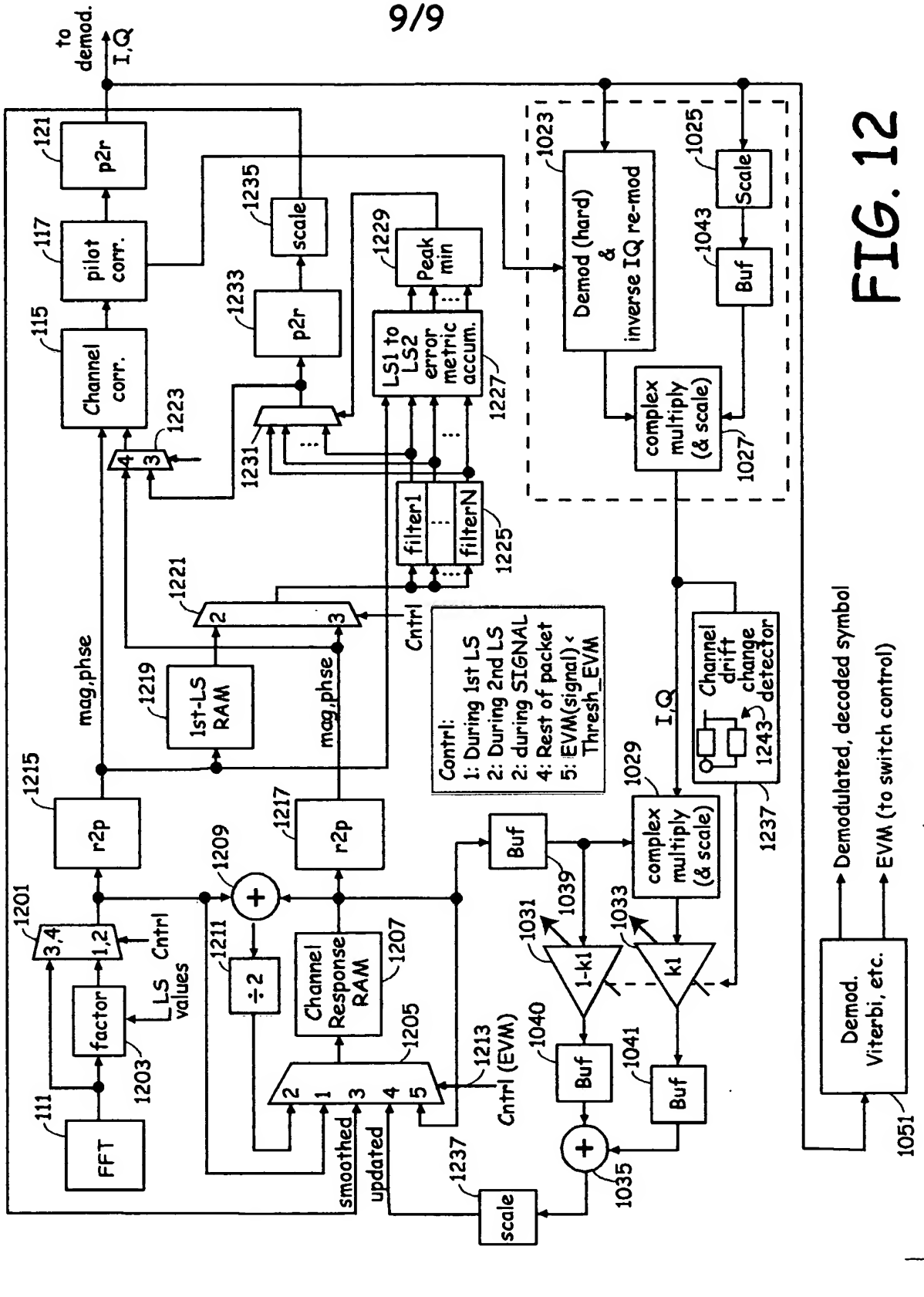
to demod.
I,Q
p2r
pilot corr.
Channel corr.
scale
p2r
Peak min
LS1 to LS2 error metric accum.
filter1
filterN
Demod (hard) & inverse IQ re-mod
complex multiply (& scale)
Scale
Buf
Cntrl
Cntrl:
1: During 1st LS
2: During 2nd LS
2: during SIGNAL
4: Rest of packet
5: EVM(signal) < Thresh_EVM
mag,phse
1st-LS RAM
r2p
Channel drift change detector
I,Q
complex multiply (& scale)
Buf
1-k1
k1
Buf
Buf
÷2
Channel Response RAM
LS values
factor
FFT
smoothed
updated
scale
Cntrl (EVM)
Demod. Viterbi, etc.
Demodulated, decoded symbol
EVM (to switch control)

FIG. 12